WHAT IS CLAIMED IS:

1. A signal processor for use in an electronic compass for processing signals from a geomagnetic compass sensor detecting sine or cosine wave signals induced by a drive signal according to an azimuth angle, comprising:

an analog signal processor for amplifying the signals from the geomagnetic compass sensor, canceling an offset voltage generated during an amplification process in response to an offset control signal, and controlling an amplitude of a signal in which the offset voltage is cancelled out in response to a gain control signal;

an analog/digital (AD) converter for converting analog signals from the analog signal processor into a digital signal; and

a digital signal processor for measuring a maximum value and a minimum value associated with the digital signal from the AD converter, deciding the offset voltage and the amplitude on the basis of the maximum and minimum values, and outputting, to the analog signal processor, the offset control signal to be used for canceling the decided offset voltage and the gain control signal to be used for controlling the decided amplitude such that it lies within an allowable input range for the AD converter.

2. The signal processor as set forth in claim 1, wherein the analog signal processor comprises:

a chopper for detecting signals from the geomagnetic compass sensor;

an input amplifier for amplifying the detected signals outputted from the chopper on the basis of a preset gain;

a low pass filter for carrying out a preset low pass filtering operation for a signal outputted from the input amplifier;

an offset controller for generating a voltage for canceling an offset in response to the offset control signal and providing the generated voltage to input terminals of the input amplifier; and

an automatic gain control (AGC) amplifier for setting an amplification gain in response to the gain control signal and amplifying a signal from the low pass filter in response to the set gain.

3. The signal processor as set forth in claim 1, wherein the digital signal processor:

measures the maximum value and the minimum value associated with the digital signal from the AD converter;

decides the offset voltage on the basis of an average value of the maximum value and the minimum value;

decides the amplitude on the basis of a difference value

between the maximum value and the minimum value; and

outputs, to the analog signal processor, the offset control signal to be used for canceling the decided offset voltage and the gain control signal to be used for controlling the decided amplitude such that it lies within the allowable input range for the AD converter.

4. The signal processor as set forth in claim 2, wherein the offset controller is configured so that an internal resistance value varies with the offset control signal and the voltage for canceling the offset is generated according to the variable resistance value.

5. The signal processor as set forth in claim 2, wherein the offset controller comprises:

an operational amplifier having an inversion input terminal for receiving a base voltage, an non-inversion input terminal coupled to a ground through a resistor, and an output terminal coupled to a supply voltage;

a resistor chain having a plurality of resistors coupled between the output terminal and non-inversion terminal of the operational amplifier in series; and

a switching unit having a plurality of switches that are coupled to each of the resistors of the resistor chain in parallel, respectively, and are turned on/off in response to

the offset control signal.

6. The signal processor as set forth in claim 2, wherein the AGC amplifier amplifies the input signals on the basis of a gain decided upon by its specific resistance value and a variable resistance value varying with the gain control signal.

7. The signal processor as set forth in claim 2, wherein the AGC amplifier comprises:

an operational amplifier having a non-inversion input terminal for receiving a signal from the low pass filter, an inversion input terminal for receiving a reference voltage from a reference voltage terminal and an output terminal;

an input resistor coupled between the inversion input terminal of the operational amplifier and the reference voltage terminal of the reference voltage; and

a feedback resistor unit coupled between the inversion input terminal and the output terminal of the AGC amplifier,

wherein the operational amplifier amplifies the input signals on the basis of a gain decided upon by a resistance value of the input resistor and a resistance value of the feedback resistor unit.

8. The signal processor as set forth in claim 7,

wherein the feedback resistor unit of the AGC amplifier comprises:

a resistor chain having a plurality of resistors coupled in series; and

a switching unit having a plurality of switches, each of the switches being coupled to each of the resistors of the resistor chain in parallel, and being turned on/off in response to the gain control signal.